Transition Mathematics for Seniors – Counselor Resource 1

Policy 2510 – WV Math sequence (as of February 2012)

It is the intent that all students in the professional pathways will take mathematics annually, but must take at least three mathematics classes in grades 9-12. The recommended course sequence, which may include college courses, AP® courses, IB courses, or virtual school courses, for students in the professional pathway is Algebra I, Geometry, Algebra II, Trigonometry, and Pre-Calculus. The recommended course sequence in the skilled pathway is Algebra I, Geometry, Conceptual Mathematics, and Transition Mathematics for Seniors or Algebra II. Transition Mathematics for Seniors must be offered annually and will be counted as a mathematics credit. Students in the professional pathway and college bound students in the skilled pathway, who do not achieve the state assessment college and career Readiness Benchmark (CCRB) for mathematics, may be required to take the Transition Mathematics for Seniors course their twelfth grade year. Consideration will be given to mathematics performance on previous assessments and completion of mathematics courses to allow students who not meet the CCRB to have other mathematics course options. Students who take the Transition Mathematics for Seniors course will take an end-of-course assessment to provide timely feedback on their readiness for college and career. The end-of-course examination will align with the WVHEPC's Series 21 Freshmen Readiness Assessment and Placement Standards.

Because of the extreme importance of mastery of the Algebra I content standards and objectives (CSOs), students who need additional time to master Algebra I CSOs may be identified at the local level using a data-based decision making process. Students who need additional time for Algebra I CSO mastery should complete the recommended math course sequence at a pace that is consistent with their ability levels. While research indicates the best option for scheduling additional time is to do so within the same year, scheduling options such as "double blocking" Algebra I, Algebra Support and Algebra I, or other similar options may be determined at the local level, as long as the priority of the selected option is to provide students the best possible opportunity to succeed in mastery of the Algebra I CSOs. Counties selecting a scheduling option that places students who need extra time into two separate math courses may grant students up to two math credits toward graduation upon successful course completion. Therefore, the mathematics course sequence for these students will be Algebra Support, Algebra, Geometry and Conceptual Mathematics. It is further recommended that students who are in the most need of continuous math instruction be enrolled in at least one math course each year in high school.

Components of Senior Transitions Math

Transitional Math for Seniors prepares students for their entry-level credit-bearing liberal studies mathematics course at the post-secondary level. This course will solidify their quantitative literacy by enhancing numeracy and problem solving skills as they investigate and use the fundamental concepts of algebra, geometry, and introductory trigonometry.
These standards are grouped by concepts and are not necessarily arranged in any specific order for presentation.

Number and Quantity - The Real Number System
At this juncture in a student's mathematical experiences, they have been exposed to a wide variety of concepts that warrant revisiting. Equivalent representations of rational and irrational numbers represented by radical signs and rational exponents are investigated. Additional coverage is given to extending

students' grasp of properties of exponents as they explore the similarities between manipulating integer and rational exponents.

Number and Quantity - The Complex Number System
Previously, students have examined the basic operations, equivalent representations and properties of the real number system. The predicament of taking even roots of a real number with a factor of negative one is now addressed in the exploration of the set of Complex Numbers. Basic operations, equivalent representations, properties and complex solutions to quadratic are addressed, as well as, the idea of conjugate pairs.

Algebra - Seeing Structure in Expressions
Students will deconstruct two and three term polynomials into equivalent expressions in factored form or by completing the square in order to identify zeros/roots/solutions along with maximum and/or minimum points.

Algebra - Arithmetic with Polynomials & Rational Expressions.
Students will review the arithmetic operations on polynomial and rational expressions. The emphasis here should be on creating equivalent expressions for both polynomial and rational expressions. We should emphasize the role factoring plays in terms of creating equivalent expressions relative to polynomials and rational expressions, as well as the role it plays in solving equations that contain these types of expressions.

Algebra - Creating Equations
Students will concentrate on creating equations or inequalities that model physical situations. The equations here should be in both one and two variables. Models should include linear, quadratic, rational, exponential and radical equations and inequalities. Systems of equations should also be included. An emphasis on the efficiency of solution as well as reasonableness of answers given physical limitations should be part of the discussion. The use of technology to model physical limitations is encouraged.

Algebra - Reasoning with Equations & Inequalities
Students will continue to develop and connect their mathematical understanding/knowledge of equations as they use and solve equations and inequalities in linear, rational, radical and quadratic formats.

Functions - Interpreting Functions
Students will continue to extend and develop their knowledge and understanding of functional notation and the concept of functions as they use, analyze, represent and interpret functions and their applications.

Functions-Building Functions
Students will further their knowledge of functions as they build new functions from existing functions.

Geometry – Congruence, Similarity, Right Triangles, &Trigonometry
In previous courses, students have had experience with rigid motions and have used these to develop notions about what it means for two objects to be congruent. Students also have established triangle congruence criteria, based on analyses of rigid motions and formal constructions. They have solved problems about triangles, quadrilaterals and other polygons. In addition students have employed the Pythagorean Theorem to solve right triangles directly and also by developing the Trig functions of sine, cosine and tangent. These objectives will serve to reinforce these ideas while deepening understanding through reasoning and proof.

Geometry-Expressing Geometric Properties with Equations
Building on their work with the Pythagorean Theorem to find distances, students will use a rectangular coordinate system to verify and prove geometric relationships and use formulas to solve related problems nvolving distance, perimeter and area.

Geometry-Modeling with Geometry
Students will apply various appropriate geometric concepts in contextual real world scenarios to solve design problems (which may involve topography, scale drawings, physical models, formulas or equations).

Statistics and Probability-Interpreting Categorical & Quantitative Data
Students will review the different ways of representing data. Both single variable data sets and two variable data sets should be presented. Statistical measures of central tendency, and variation should be discussed relative to one-variable data sets. Histograms, pie charts, bar graphs, box and whisker plots should be discussed. Scatter plots and linear regression should be covered relative to two variable data sets. The emphasis here should be how a change in the data influences the slope of the regression line.

Mathematical Practices

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.

3. Construct viable arguments and critique the reasoning of others.

4. Model with mathematics.

5. Use appropriate tools strategically.

6. Attend to precision.

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

NOTE:

Rubrics defining performance lessons for each math concept can be located in 2520.26